

Estimating the Impact of Hurricane Katrina on EHCPM Projections for FYs 2006 to 2023

Background

Hurricane Katrina hit the Gulf Coast on August 29, 2005, severely impacting the lives of residents in the New Orleans, Louisiana and Biloxi/Gulfport, Mississippi areas. The hurricane impacted the populations of the Gulf Coast in different ways. Due to the difficult nature of tracking individuals, estimates of the number of people impacted by Hurricane Katrina vary widely. These estimates range from 700,000 to 2.4 million. Regardless of the ranges of these estimates, it is undisputed that the majority of the population in New Orleans was displaced. In addition, due to the number of houses and businesses that were completely destroyed by the hurricane, it is clear that a significant number of residents in the Biloxi/Gulfport area were displaced. The question facing VA is: how many veterans and veteran enrollees were impacted and/or displaced by Hurricane Katrina and how will future VA health care expenditures be impacted?

VA has major health care systems located in these two areas. The VA Medical Center in New Orleans (450 bed acute care facility) was impacted by severe flooding and is essentially out of commission. Temporary outpatient clinics have been established in the New Orleans area to fulfill VA's commitment to meet the health care needs of its veteran patients. The VA mental health facility in Gulfport was damaged by the hurricane and patients were transferred to the VA hospital in Biloxi, which sustained minimal damage. It is important for VA to understand the impact of Hurricane Katrina on the veteran and veteran enrollee population in order to devise a plan to meet the future needs of veterans in the New Orleans and Biloxi/Gulfport areas.

Methodology

The VA Enrollee Health Care Projection Model (EHCPM) develops enrollment, workload and expenditure projections at the sector level. This means it is possible to modify many of the model assumptions to estimate the impact of the extensive migration of veterans and enrollees away from Hurricane Katrina impacted areas to the rest of the U.S., as well as the demographic shift due to the economic hardships endured by many who lived in the Katrina impacted areas. To understand the methodology for estimating the impact Katrina had and will have on VHA enrollment, workload and expenditures, one must first understand the general model structure of the EHCPM.

The VA Office of the Actuary produces a projection of the veteran population to 2025 and beyond. VHA tracks veterans who have enrolled in the VHA health care system. These enrollees are removed from the veteran population estimates to produce the pool of veterans who might enroll in the future. Enrollment rates are developed to project how many of the veterans in the pool will enroll each year. The demographics of the enrolled veterans (both current and future) are modeled to change over time, reflecting enrollee aging, priority level transition, geographic migration, and mortality. The size of the projected enrolled population and the demographic mix of this population are key variables in estimating future VHA workload and expenditures. The EHCPM is based on many detailed assumptions that can be modified to estimate the impact of various scenarios.

To estimate the impact of Katrina, the veteran and veteran enrollee population was modified to reflect the sudden change in geographic location of many veterans (Immediate Veteran Dispersion). These veterans, who were displaced as a result of Katrina, were then slowly migrated back to the Katrina impacted areas over the 20-year projection period (Long-term Return of Veterans). In addition, some of the displaced veteran enrollees were assumed to transition from priority levels 6, 7 and 8 to priority level 5 due to economic hardships (priority level shock) suffered as a result of the Hurricane (Immediate Economic Hardship).

It is difficult to measure how Hurricane Katrina influenced veterans' short-term behavior in its wake and even more difficult to predict how it will influence long-term behavior. There is a wide range of possible outcomes over the next twenty years. The EHCPM was used to create 20-year projections under three scenarios, each with a distinct set of model assumptions. This allows VA to understand the sensitivity of the enrollment, workload and expenditure projections to model assumptions. The three scenarios represent a middle estimate, a low estimate and a high estimate for the Katrina impacted areas. These scenarios represent three reasonable outcomes that could unfold over the next twenty years. They are within a wide range of reasonable outcomes. The Middle scenario, considered the best estimate, has the highest likelihood. Furthermore, the Low and High scenarios are believed to be reasonable outcomes, though they do not necessarily represent the extremes of the reasonable range of outcomes.

A summary of the various assumptions (in general terms) reflected in each of the scenarios is included in Table 1. In general, the Middle scenario represents an immediate geographic dispersion and economic hardship, followed by a steep and then gradual return of veterans, and a gradual shift in the priority level distribution of the affected areas toward average U.S. urban

economic conditions, rather than pre-Katrina New Orleans economic conditions. In the Low scenario, the return of displaced veterans to and the shift in priority distribution of the affected areas is assumed to occur more gradually. In the High scenario, veterans are assumed to return more quickly to the affected areas, and long-term enrollment rates and enrollee reliance on VA health care are assumed to increase. The Base scenario reflects EHCPM projections using pre-Katrina data and assumptions.

Table 1 Summary of General Model Assumptions by Scenario				
Assumption	Base	Low	Middle	High
Immediate Veteran Dispersion	No	Yes	Yes	Yes
Long Term Return of Veterans	No	Slow	Medium	Fast
Immediate Economic Hardship	No	No	Moderate	High
Long-term Enrollment Rate	Historical	Historical	Historical	Accelerated
Enrollee Reliance	Historical	Historical	Historical	Elevated

Modified Assumptions

The assumptions listed in Table 1 were developed using various information and data provided by VA and obtained from the internet. Only four sectors (geographic areas that consist of a single urban county or multiple adjacent counties) were subjected to an immediate veteran dispersion in the wake of the hurricane. These sectors and the areas they represent are listed in Table 2.

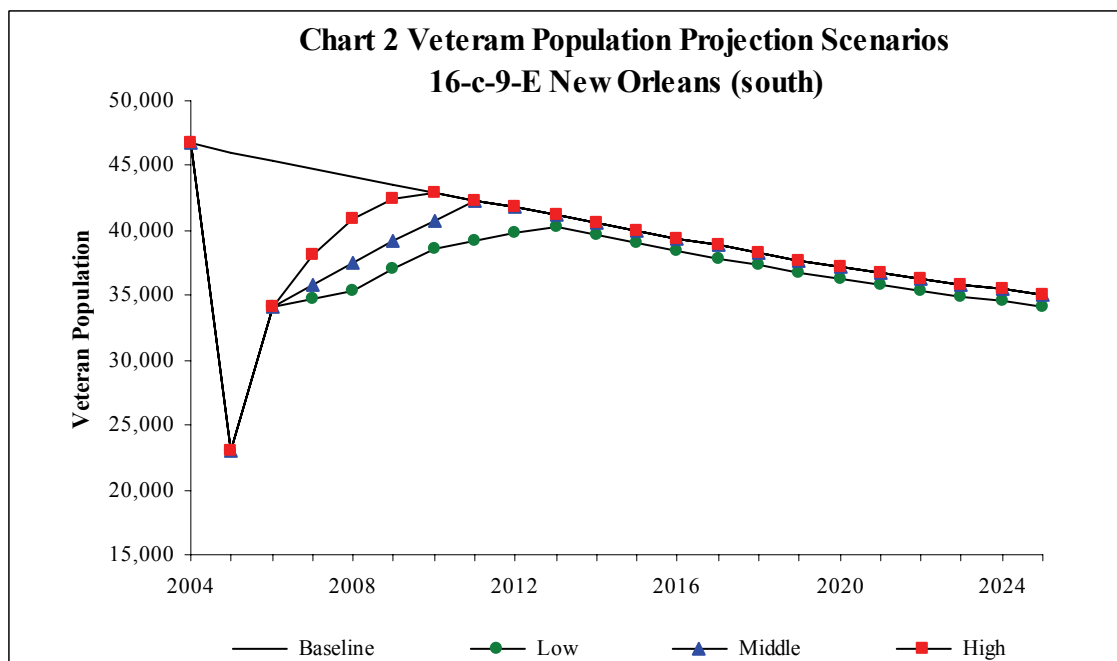
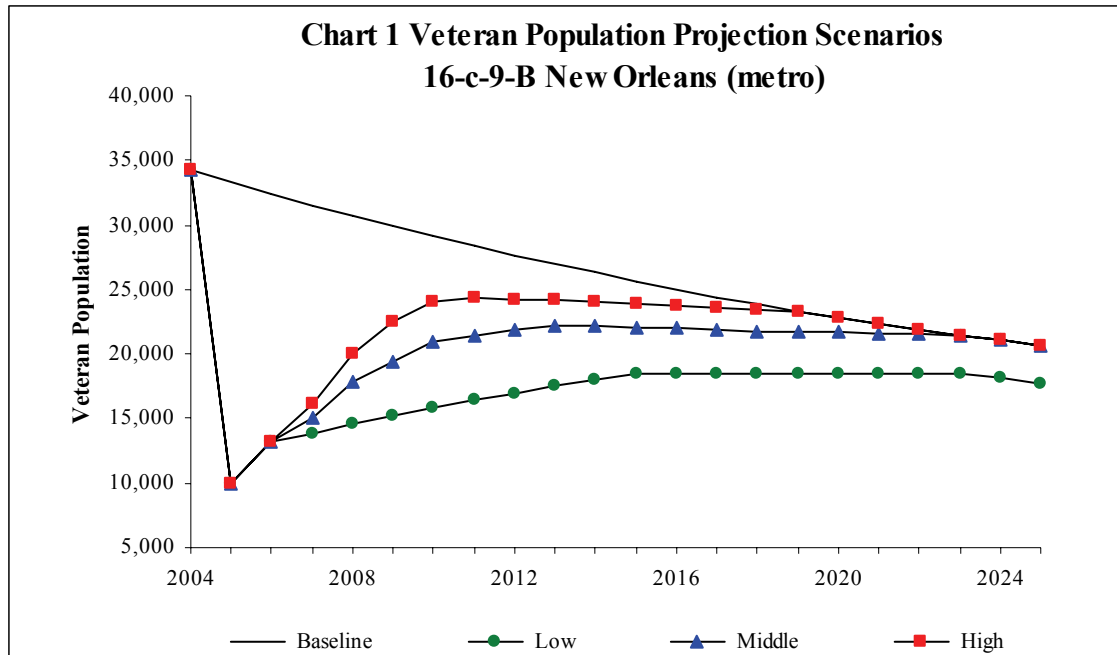
Table 2 Geographic Areas with Assumed Veteran Migration (Shock)		
Sector	Description	Counties / Parishes
16-c-9-B	New Orleans (metro)	Orleans Parish
16-c-9-E	New Orleans (south)	Jefferson, St. Bernard, Plaquemines Parishes
16-c-9-F	Biloxi/Gulfport	Harrison County
16-c-9-I	New Orleans (north)	St. Tammany, Tangipahoa, Washington, St. Charles, St. John the Baptist, St. James Parishes

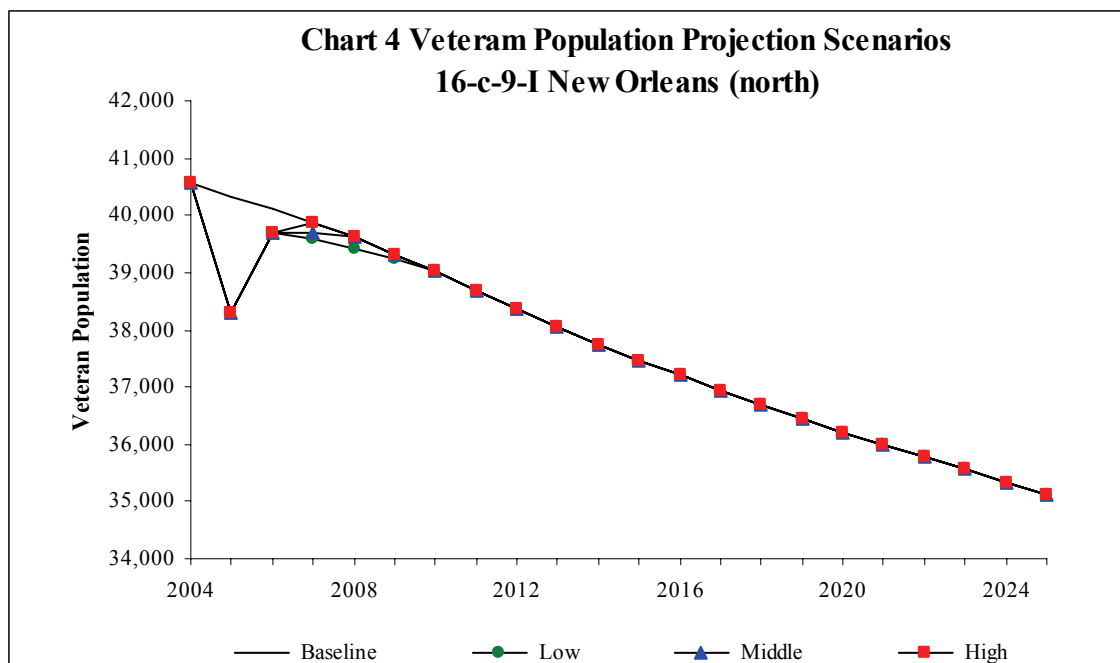
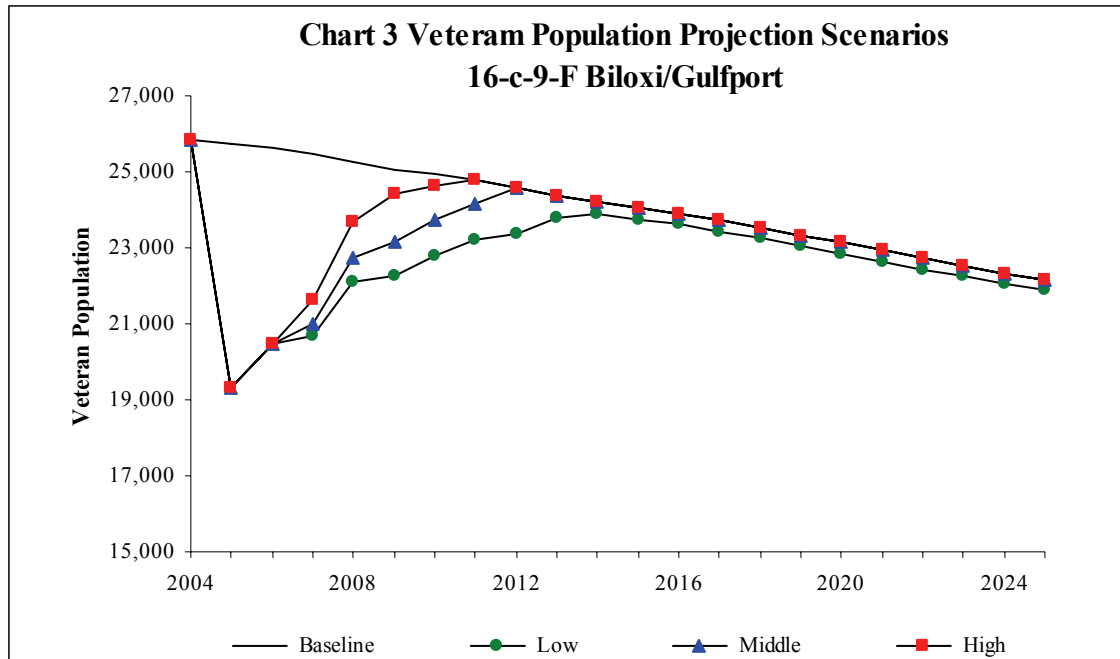
Two main data sources ^{1,2} were relied upon to estimate the percentage of veterans that were displaced in these four sectors as a direct result of Hurricane Katrina. These estimates were based on general population displacement estimates. It is estimated that approximately 70% of veterans in the New Orleans (metro) area were immediately displaced due to Katrina. The veterans in the New Orleans (south) area were also hit hard, and it is estimated that 50% were displaced. The Biloxi/Gulfport displacement estimate is quite a bit lower at 25%. Finally, the New Orleans (north) area sustained much less damage, and the displacement estimate is only 5%. These geographic shocks were phased in for both the veteran and veteran enrollee population between August and October of 2005.

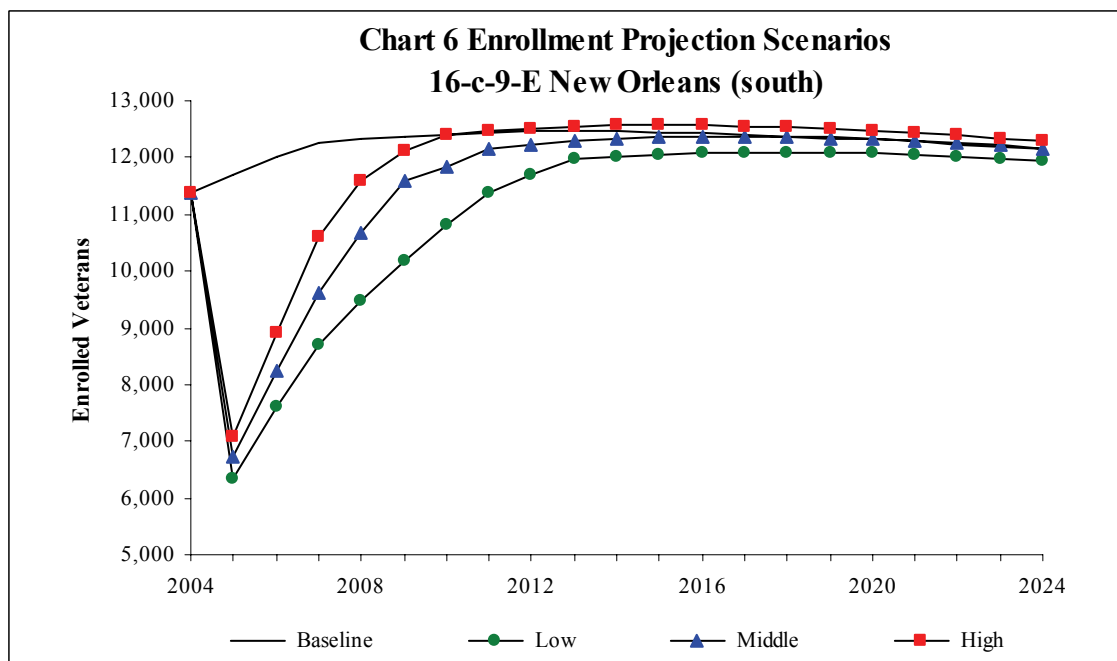
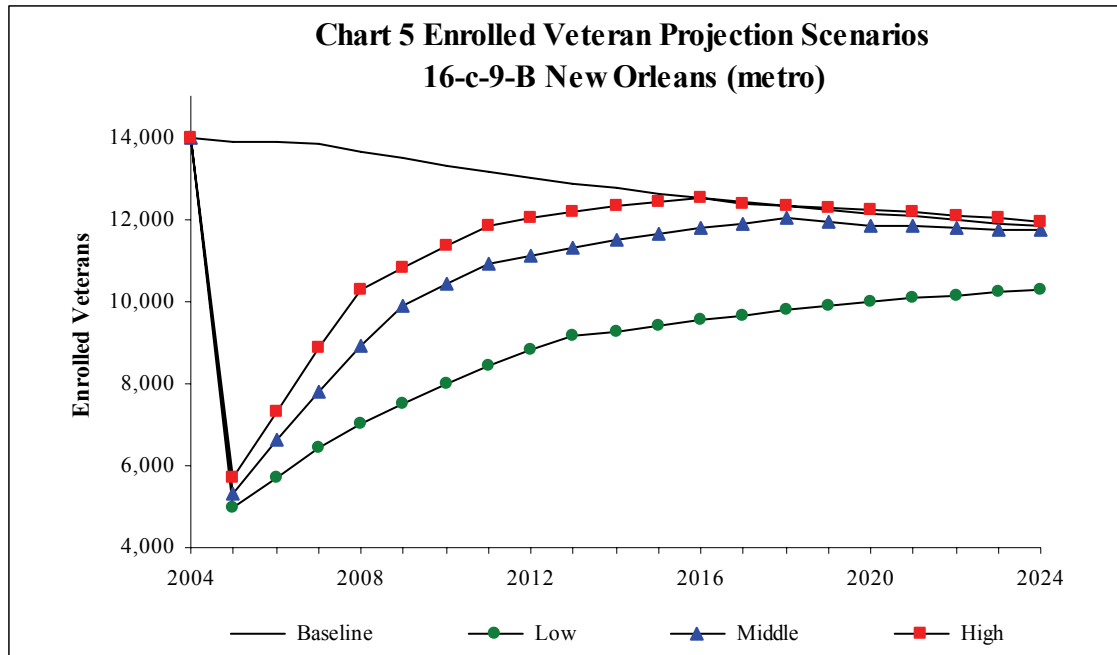
The slow, medium, and fast long-term geographic migration patterns were based upon assumed rates of return among veterans due to the rejuvenation of local economies, availability of housing, the desire to return, and steps that may be taken by VA to remodel, replace, or enhance veteran healthcare facilities in the affected areas. In no scenario were the 20-year migration patterns assumed to lead to veteran populations in the affected areas that are significantly higher than in the Base scenario. For the Low scenario, the assumed migration patterns lead to 20-year population estimates that are lower than the Base scenario. The Middle scenario assumes, by the end of the 20-year projection period, that all four sectors have gradually regained veteran populations to coincide with the Base scenario. The High scenario reaches the level of the Base scenario earlier in the 20-year projection period. The New Orleans (metro) area has the slowest recovery (population migrating back) of the four impacted areas due to the nature of the damages in this area (sustained flooding, incapacitated utilities, unsanitary conditions, etc.). On the other hand, it is assumed that the Biloxi/Gulfport area will recover much more quickly. The devastation in this area is mainly due to the high winds completely destroying houses and businesses and it is assumed that they can be rebuilt within a few years. Also, the Casinos, major employers in the area, are expected to be back in full operation during FY 2008, which will draw population back to the area. The following charts depict the impacts of the immediate dispersion and long-term return on veteran population projections (Charts 1-4) and veteran enrollee projections (Charts 5-8) for the four areas under each scenario. In each graph, the population levels correspond to estimates as of the end of each fiscal year.

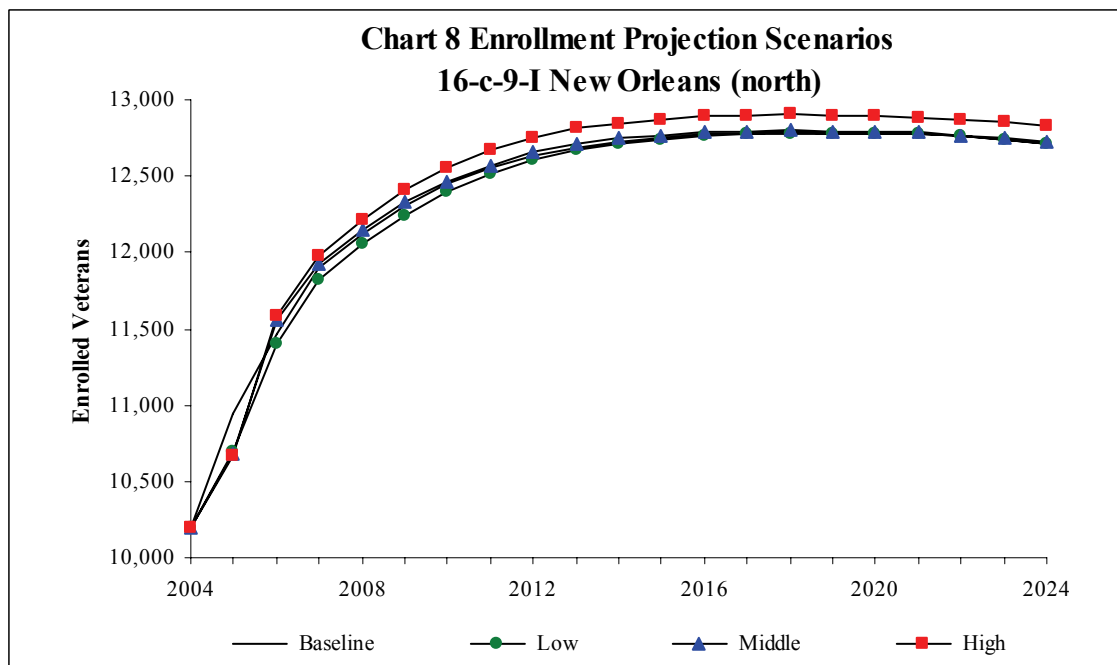
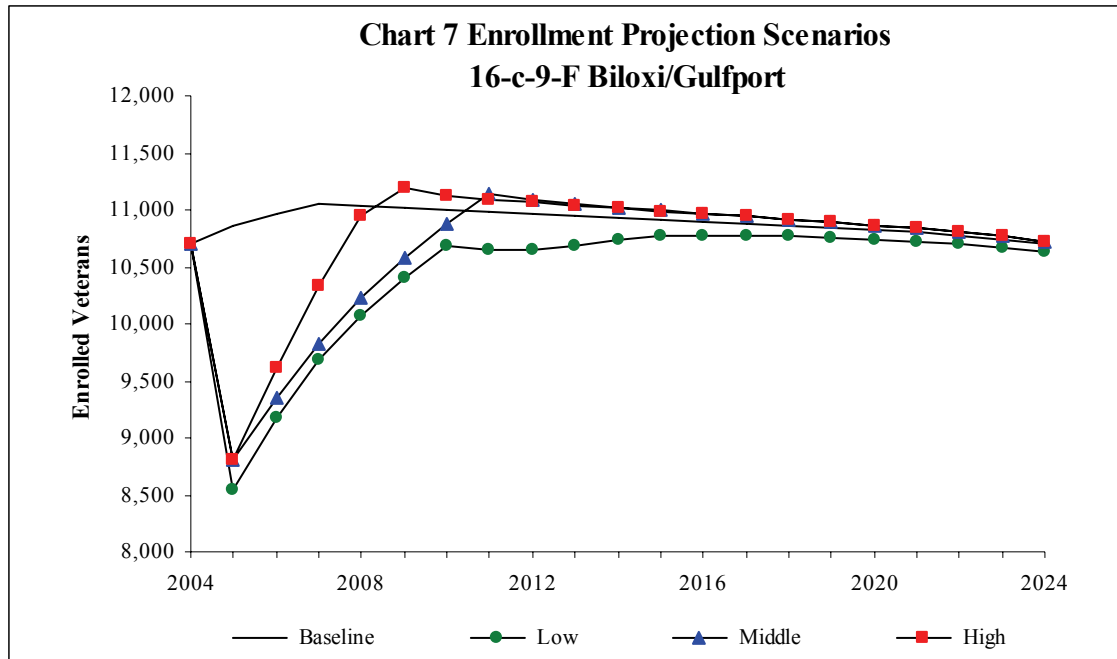
¹ Hurricane Katrina: Social-Demographic Characteristics of Impacted Areas, CRS Report for Congress, November 4, 2005

² Internet website www.gnocdc.org - Post-Disaster Population Estimates by LA DHH Bureau of Primary Care and Rural Health (Oct 2005 -Jan 2006)









No data was available to assist in establishing the three priority level shocks (Immediate Economic Hardships levels: none, moderate, and high). However, it is reasonable to assume that for the High scenario the majority of the displaced priority level 6, 7, and 8 enrollees lost their homes and jobs. In this case, the assumption is that 75% of the priority levels 6 through 8 enrollees now qualify as priority level 5. The Middle scenario assumes that 50% transition to priority level 5 and the Low scenario assumes that none of them transition to priority level 5.

It is not anticipated that Long-term Enrollment Rates in the New Orleans areas will change; however, once New Orleans is rebuilt, veterans may have a higher propensity to enroll. Possible reasons for this are that the VA facility in New Orleans may be extremely convenient to the returning veteran population; the health care system in New Orleans may not be replaced as quickly as the VA system; or the new VA facility may be “state-of-the-art” and attract new veterans. Only the High scenario has modified enrollment rates for the New Orleans areas. In addition, the enrollment rates in the Baton Rouge area were also slightly increased due to their dependency on certain care in New Orleans.

Finally, for the same reasons discussed above, Enrollee Reliance on VA health care is also not expected to change significantly. The High scenario includes slightly higher reliance assumptions for the geographic areas with assumed veteran migration (four sectors listed in Table 2), and for Baton Rouge (sector 16-c-9-K).

Modified Projections

The near term projections for the Katrina impacted areas under the Low, Middle, and High scenarios are lower than under the Base scenario, which is based on pre-Katrina assumptions.. Nationally, however, the projections remain unchanged as the displaced veteran enrollees are expected to continue to demand VHA health care, just in different locations. Over time, the projections under the Middle and High scenarios converge to the Base scenario, becoming the same in 20 years. Tables 3 and 4 illustrate the impacts for enrollees, patients and expenditures for FY 2006, FY 2008 and FY 2023 for selected counties. Table 3 provides some detail for the Middle scenario. Table 4 shows the impacts for the three scenarios. In addition, Table 4 includes the national impacts.

Table 3
Middle Scenario Impacts for Selected Areas

	Enrollees		Patients		Expenditures (1,000s)	
	Estimated	Impact	Estimated	Impact	Estimated	Impact
FY 2006						
New Orleans (metro)	5,364	-62%	3,599	-62%	\$28,394	-63%
New Orleans (south)	7,229	-40%	4,894	-40%	\$34,513	-42%
New Orleans (north)	11,159	-2%	7,596	-2%	\$50,619	-2%
Biloxi/Gulfport, MS	8,826	-19%	5,940	-19%	\$43,807	-20%
Baton Rouge, LA	9,754	19%	6,581	20%	\$39,075	23%
Jackson, MS	9,101	6%	6,006	6%	\$38,293	7%
Houston, TX	58,867	4%	39,458	5%	\$265,191	5%
FY 2008						
New Orleans (metro)	7,851	-43%	5,292	-44%	\$45,701	-47%
New Orleans (south)	9,879	-21%	6,736	-22%	\$54,821	-23%
New Orleans (north)	12,249	0%	8,405	0%	\$63,917	0%
Biloxi/Gulfport, MS	9,846	-11%	6,649	-11%	\$54,763	-12%
Baton Rouge, LA	9,808	14%	6,684	15%	\$45,174	18%
Jackson, MS	9,004	5%	5,993	5%	\$43,316	6%
Houston, TX	60,206	3%	40,862	3%	\$310,141	4%
FY 2023						
New Orleans (metro)	11,667	-1%	8,317	-2%	\$134,153	-4%
New Orleans (south)	12,219	0%	8,970	0%	\$142,713	0%
New Orleans (north)	12,752	0%	9,296	0%	\$140,857	0%
Biloxi/Gulfport, MS	10,694	0%	7,554	0%	\$118,594	0%
Baton Rouge, LA	9,555	1%	6,855	1%	\$90,955	2%
Jackson, MS	8,210	1%	5,706	1%	\$78,106	1%
Houston, TX	59,563	0%	42,689	0%	\$631,956	0%

Impacts are measured as the percentage change from projections with pre-Katrina assumptions.

Expenditures are defined as those necessary to provide demanded health care to veteran enrollees under normal operating conditions. They are not intended to represent any of the additional costs associated with capital and personnel recovery as a result of Hurricane Katrina.

Table 4
Katrina Impacts for Selected Areas

	Patient Percentage Impact			Expenditure Percentage Impact		
	Low	Middle	High	Low	Middle	High
FY 2006						
New Orleans (metro)	-64%	-62%	-60%	-65%	-63%	-61%
New Orleans (south)	-43%	-40%	-38%	-45%	-42%	-40%
New Orleans (north)	-2%	-2%	-2%	-2%	-2%	-2%
Biloxi/Gulfport, MS	-21%	-19%	-19%	-22%	-20%	-20%
Baton Rouge, LA	20%	20%	20%	22%	23%	24%
Jackson, MS	6%	6%	6%	7%	7%	7%
Houston, TX	5%	5%	5%	5%	5%	6%
National	0.02%	0.02%	0.03%	-0.03%	-0.01%	0.00%
FY 2008						
New Orleans (metro)	-54%	-44%	-36%	-55%	-47%	-36%
New Orleans (south)	-28%	-22%	-13%	-29%	-23%	-8%
New Orleans (north)	-1%	0%	2%	-1%	0%	10%
Biloxi/Gulfport, MS	-13%	-11%	-6%	-13%	-12%	0%
Baton Rouge, LA	15%	15%	15%	18%	18%	22%
Jackson, MS	5%	5%	5%	6%	6%	6%
Houston, TX	4%	3%	3%	4%	4%	4%
National	0.01%	0.01%	0.03%	-0.02%	0.00%	0.08%
FY 2023						
New Orleans (metro)	-16%	-2%	2%	-18%	-4%	8%
New Orleans (south)	-2%	0%	3%	-2%	0%	11%
New Orleans (north)	0%	0%	2%	0%	0%	11%
Biloxi/Gulfport, MS	-1%	0%	2%	-1%	0%	10%
Baton Rouge, LA	3%	1%	2%	3%	2%	6%
Jackson, MS	1%	1%	0%	1%	1%	1%
Houston, TX	1%	0%	0%	1%	0%	0%
National	0.00%	0.00%	0.01%	-0.01%	0.00%	0.09%

Impacts are measured as the percentage change from projections with pre-Katrina assumptions.

Expenditures are defined as those necessary to provide demanded health care to veteran enrollees under normal operating conditions. They are not intended to represent any of the additional costs associated with capital and personnel recovery as a result of Hurricane Katrina.

Caveats and Limitations

The analyses in this report rely in part on data and other listings provided by various personnel at VA. That data has been reviewed for reasonableness and compared to past data submissions and other information, when possible. The information has not been audited by Milliman for accuracy. If the data or other listings are inaccurate or incomplete, this analysis may also be inaccurate or incomplete. In addition, internet searches were used to obtain supplemental information to assist in the development of the assumptions used in this modeling effort. Reports and opinions produced by government entities or presented to government entities were heavily relied upon. General impressions regarding the future of the Katrina/Rita impacted areas were gleaned from other sources.

Some of the information in this analysis is based on modeling assumptions and historic data. Other assumptions were based entirely on judgment due to the lack of any historical data that might be reflective of the restoration of a major U.S. metropolitan area and surrounding cities/towns devastated by a hurricane. Estimates presented in this report will only be accurate if future experience exactly replicates those data and assumptions used in this analysis. Given the unpredictability of how the affected areas will recover, it is almost certain that the outcome will differ from the three scenarios. In addition, many of the modeling variables are assumed to be constant over time. Therefore, emerging experience should be continually monitored to detect whether expectations based on this analysis are appropriate over time.

The results contained in this report are projections. It is impossible to determine how world events will unfold. Those events that impact the economy and the use of the nation's military may have a profound impact on enrollment and expenditure projections into the future. The analysis has not attempted to present results for events where data is not yet available to consider their impacts on enrollment and expenditures, beyond those directly related to modeling the impact of Katrina. It is important that actual enrollment and costs be monitored and the projections updated regularly based on this changing environment.